



Name: \_\_\_\_\_

Date: \_\_\_\_\_ HR: \_\_\_\_\_

## The Laboratory Thermometer

**Question:** What is a laboratory thermometer like and how does it work?

**Caution:** A glass thermometer breaks easily. Handle it carefully.

**Materials:** Laboratory Thermometer (with scale from below  $0^{\circ}\text{C}$  to above  $100^{\circ}\text{C}$ )  
Journal page

### Procedure:

1. Examine the thermometer carefully. Notice where the glass is thick and where it is thin.
2. Put these labels on the thermometer on your journal page: (12 marks)
  - liquid (coloured alcohol)
  - thick glass
  - thin glass
  - freezing point of water ( $0^{\circ}\text{C}$ )
  - lowest temperature (state what it is)
  - average room temperature ( $20^{\circ}\text{C}$ )
  - bore (storage space for the liquid)
  - bulb (storage space for the liquid)
  - the scale
  - boiling point of water ( $100^{\circ}\text{C}$ )
  - highest temperature (state what it is)
  - average normal body temperature ( $37^{\circ}\text{C}$ )

Answer the following on your journal page (2 marks)

3. What happens to the temperature reading if you place your hand around the middle of the thermometer?
4. What happens to the temperature reading if you put your hand around the bulb?

**Questions:** Answer the following questions on your journal page (7 marks)

5. The bulb is an important part of a liquid thermometer. Give reasons why.
6. Which part of the thermometer has the thinnest glass? Why do you think it is made like this?
7. How many Celsius degrees are there between the freezing point of water and the boiling point of water?
8. Celsius degrees are also called centigrade degrees by some people. Explain why. (Hint: What does centi mean?)
9. Why should you not put this thermometer into a liquid at  $300^{\circ}\text{C}$ .
10. Find out why mercury is no longer used in making thermometers for use in school.

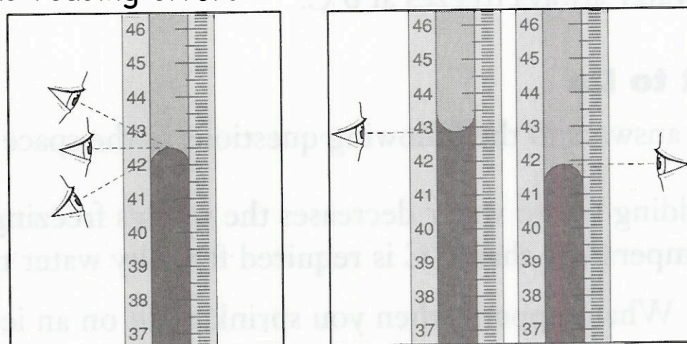
## Reading A Thermometer

**Goal:** To Review how to read a thermometer accurately.

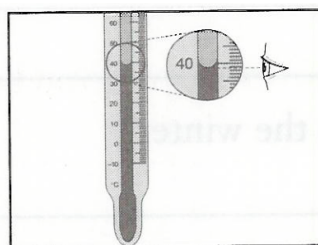
### Think About It

When experimental measurements are made, errors can be caused by carelessness. The most common errors are parallax errors and reading errors.

A parallax error occurs when your eye is not placed directly opposite the scale where the reading is being taken. When reading the liquid level, your eye must be lined up with the top or bottom of the meniscus.



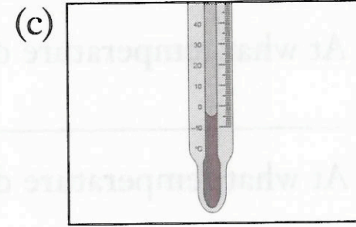
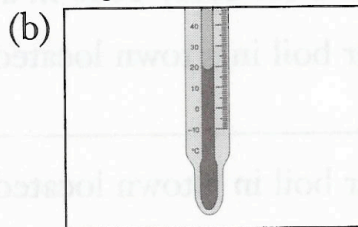
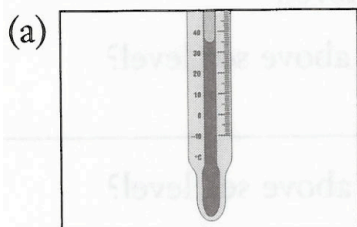
A reading error occurs when you must estimate because the liquid lies somewhere between scale divisions. Try to estimate as accurately as possible, to the nearest half degree.



**What to do** (please answer these questions directly on this page; when finished check your answers with your teacher.)

Use the information from above to help you answer the following questions.

1. What is the temperature reading indicated by each thermometer?



\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. Draw a thermometer to illustrate each of the temperatures below.

a. 52.0°C

b. -2.0°C

c. 20.5°C